

READOUT

SYSTEMS

DESIGN



alpha-numeric systems

With the accelerating growth of data handling and processing equipment has come an increasing need for more versatile information display systems to bridge the communications gap between man and machine. Machines have achieved such fantastic degrees of speed and efficiency that the human factors problems...how best to display information so that man can understand the machines' results and make effective decisions...have become quite serious. The Burroughs Corporation, Electronic Components Division, with many years of experience in the field of electronic information display, has formed an Alpha-Numeric Display Systems Group which is capable of solving a significant segment of this type of display problem.

group develops display concept

The formation of this group was prompted largely by the development of Burroughs' segmented Alpha-Numeric NIXIE® Tube. The new tube was a natural outgrowth of years of experience with numeric NIXIE Tubes. It combined all the features which made the numeric devices industry's most

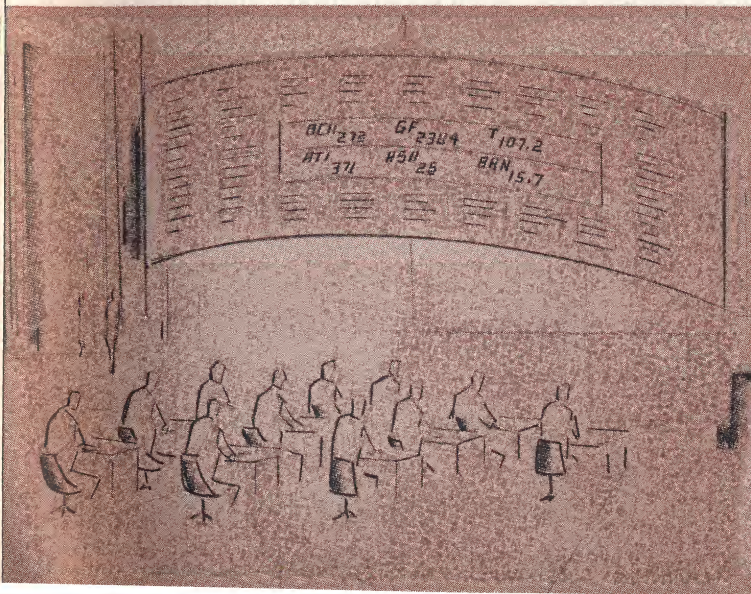
popular readout with a completely alpha-numeric capability, to open up whole new areas in the field of electronic information display.

One of the group's first jobs was development of a low cost memory technique which would eliminate the necessity for duplication of decoding and segment selection circuitry. This effort resulted in the development of a new memory module which, when combined with standard decoding and encoding modules already in production, made possible the design of completely modular display systems.

modular concept simplifies design

Now with this modular concept, complete alpha-numeric information displays can be tailored to meet specific input requirements and display format designs with a minimum of effort. The accompanying illustrations contain just a few samples of the many display system variations possible with this technique. Since alpha-numeric displays by their very nature are essentially tabular, that is, they contain a fixed number of character positions arranged in rows and columns, the systems problem is simply one of inserting the proper character into the proper position at the proper time.





various formats employ standard modules

Methods for meeting varying input requirements fall basically into two broad categories: random update and preprogrammed update. The random type includes any system in which the information to be displayed must carry with it the position it is to occupy in the display. This would be particularly applicable to schedule boards, arrival-departure displays, etc. The preprogrammed type includes those systems where the positioning of a character in the display is determined by the display system logic itself. Moving headline or left-to-right sequential write-in displays would be of this type. In either case, many different display format designs can be accommodated using standardized display modules and varying the method of address or character positioning.

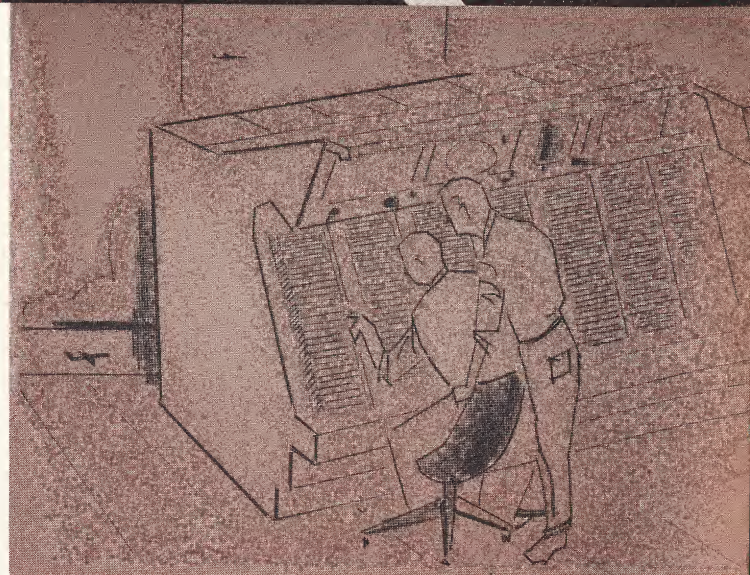
The block diagram on page 4 serves to illustrate this point. It shows a typical single-line 32-tube system in which the address method consists of a five-bit binary to 1 out of 32 decoder fed by a straight binary counter. It is not difficult to see that this display could be made random update by having system inputs consist of two character words in which the first character designates position and the second contains the information. Since the information is generally available

in some form of binary code, the Burroughs BIP-8101, a standard six bit to 1 out of 64 decoder can be used to identify the one character desired out of the possible 64. The output of the decoder can thus be fed to another standard Burroughs module, the BIP-8113, to convert the one out of 64 information to the appropriate N of 13 segments, thereby generating the desired character or symbol.

code conversion and memory

Since the standard modules can convert any six-bit code to one out of 64, and 64 different inputs encoded to N of 13 will accommodate 64 different characters, it is possible to convert from any six-bit code to any character using two standard modules. Differences in code configurations can be handled simply by changing the interconnections between the decoder and encoder. Finally the output of the N of 13 encoder is fed to the standard memory driver module associated with each tube. The memory driver module stores the information enabling the address and decoding circuitry to handle the next character to be displayed.

Here then is a display technique which is not only powerful, but very flexible as well. Many different situations can be accommodated using standard sets of display modules to provide a completely custom display.





basic components combined in display systems

Burroughs capabilities have grown consistently in the areas related to electronic information displays. Recent extensions of plant facilities have implemented increased production in both the tube line and the manufacture of semi-conductor devices. Each of these two basic products lends specific advantages to Burroughs systems.

display tube contributes unique features

The display tubes themselves are cold-cathode, glow-discharge devices in which alpha-numeric characters can be formed by engaging the appropriate combination of cathode segments. The characters appear as a bright "continuous line" red neon glow which can be easily read under high ambient light conditions at distances up to 25' for the standard size (.7" character) tube, Type B-5971, and up to 90' for the large size (2.5" character) tube, Type B-7971. In addition to presenting



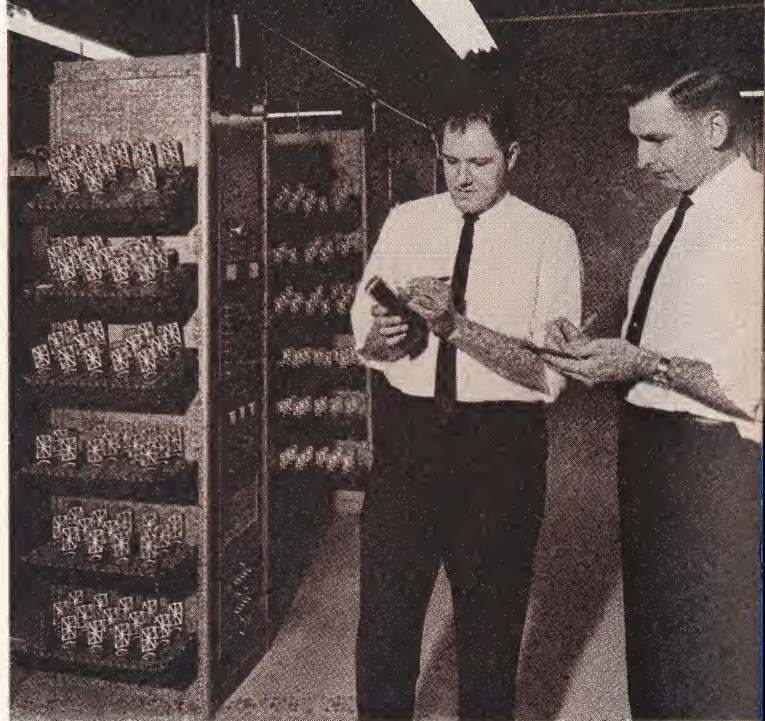
an extremely readable display, Alpha-Numeric NIXIE Tubes promise an exceptional degree of reliability, and provide long life with no fading.

semi-conductor modules increase system reliability

Burroughs semi-conductor driver modules, designed specifically for incorporation in the Alpha-Numeric Display Systems, reduce system complexity, thereby increasing reliability.

The extremely compact memory module contains a unique, all solid state circuit which operates up to 10 Kc. Thirteen bits of memory are contained in the $2\frac{1}{2} \times 1\frac{1}{2}$ " package. The decoders and encoders are fabricated using Burroughs highly reliable BIPCO multi-element diode matrices. Use of these modules keeps interconnections to a minimum, contributing to increased system reliability and low cost.

The enclosed card will enable you to conveniently apprise us of your interest and application.



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